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SPECT EVALUATION OF THE EFFECT OF QRS MORPHOLOGY AND MECHANICAL DYSFUNCTION ON LEFT VENTRICULAR DYSSYNCHRONY

ACC Moderated Poster Contributions
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Session Title: Evaluation of Left Ventricular Dyssynchrony by Myocardial Perfusion Imaging
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Authors: *Daniel R. Ludwig, Prashant Atri, Mati Friehling, David Schwartzman, Prem Soman, University of Pittsburgh, Pittsburgh, PA, USA*

Background: Prolonged electrocardiographic QRS duration (QRSd) and diminished left ventricular (LV) ejection fraction (EF) are each known to predict LV mechanical dyssynchrony. Whether and how they interact in this regard is less clear.

Methods: We performed dyssynchrony analysis of LV mechanical activation derived from single-photon emission computed tomographic (SPECT) images from 171 patients, none of whom had LV scar. Dyssynchrony magnitude was quantified by calculating the standard deviation of time to mechanical activation (SD) over more than 600 separate LV myocardial regions. Patients were grouped by EF (Group 1: preserved EF, defined as >50%; Group 2: diminished EF, defined as <45%) and QRSd (Group A: normal, defined as <120 msec; Group B: prolonged [defined as >120 msec] without left bundle branch block [LBBB] pattern, Group C: prolonged with LBBB pattern).

Results: (Figure): Among patients with preserved EF, LV mechanical dyssynchrony was observed only among patients with QRS prolongation having a LBBB pattern. By contrast, among patients with diminished EF: 1. dyssynchrony was observed irrespective of QRS prolongation, and 2. the magnitude of dyssynchrony was greater among patients with QRS prolongation, irrespective of electrocardiographic morphology.

Conclusions: These data suggest a synergistic relationship between EF diminishment and QRS prolongation in their association with LV mechanical dyssynchrony. Mechanisms underlying such a relationship remain to be clarified.